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·ALVMNI· REPORT·

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THE·PHILADELPHIA·COLLEGE·OF·PHARMACY·

PUBLICATION OFFICE, 145 N. TENTH ST., PHILADELPHIA

VOL. XXXVI. JANUARY, 1900. No. 1.

··· Contents ···

EDITORIAL:

Philadelphia Association of Retail Druggists.

PHARMACEUTICAL MEETING:

The History of the Constitution of the Alkaloids.

The Herb and Drug Vending on the Sidewalks of Philadelphia.

Oil of Orange.

PAPERS:

Powdered Extracts—Their Mode of Preparation and Preservation. By William E. Jenks.

Plant Enzymes as a Possible Factor in Drug Actions. By Joseph W. England.

OUR GRADUATES.

CLASS NEWS.

ITEMS.

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TELEPHONE CONNECTION

Philadelphia Association of Retail Druggists

The next regular meeting of the Philadelphia Association of Retail Druggists will be held at the Philadelphia College of Pharmacy, 145 North Tenth Street, Friday, February 2d, 1900, 3 P.M.

It is expected that during this month the Chairmen of the Ward Committees will call on the retail druggists, to have signed the Petition relating to the Stamp Tax on Medicines.

WM. McINTYRE, PRESIDENT. W. A. RUMSEY, SECRETARY.

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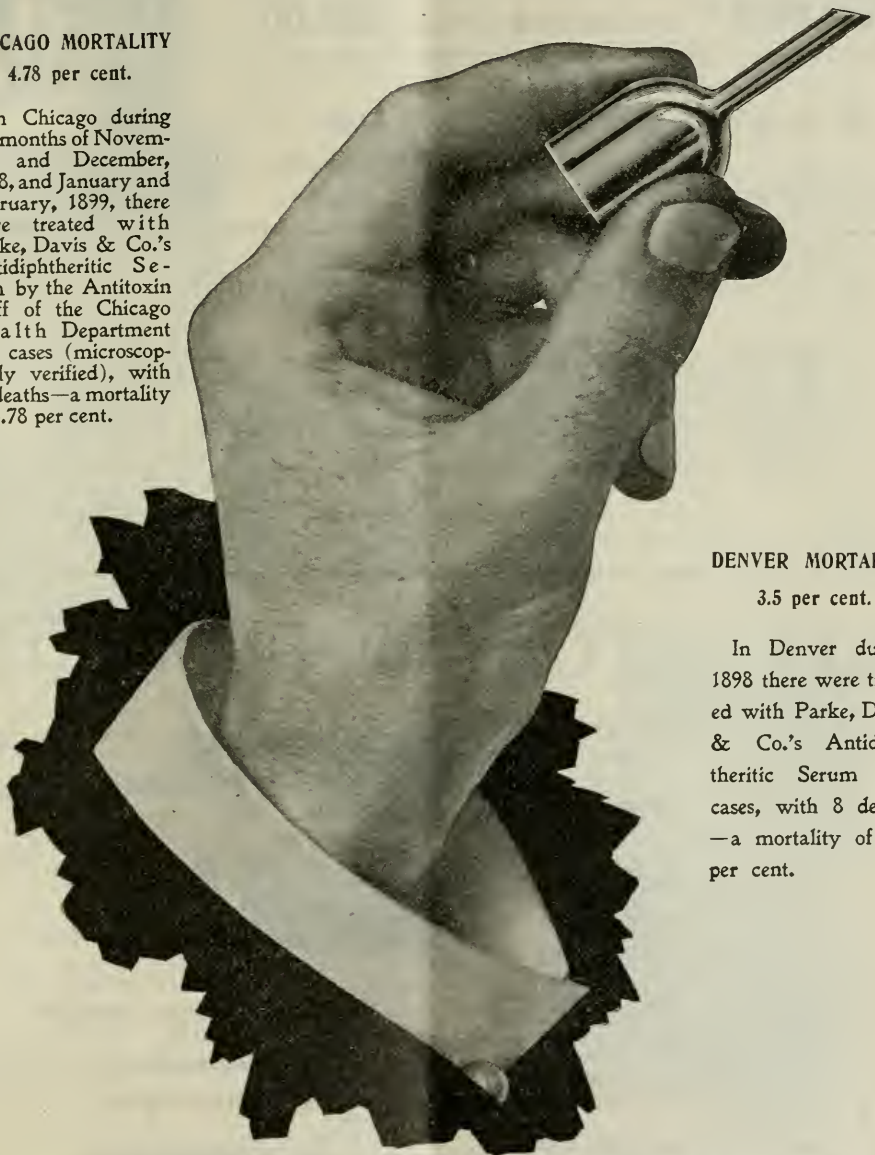

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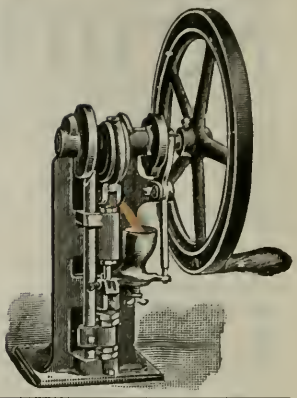
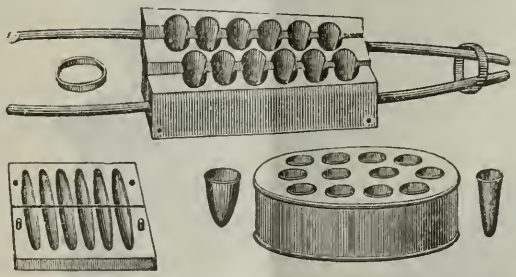


ALUMNI SOCIAL MEETING.

THE next Social Meeting of the Alumni Association of the Philadelphia College of Pharmacy will be held on Tuesday evening, January 16, 1900, at 145 North Tenth Street, this city. *You are cordially invited to be present.*

COMMITTEE ON SOCIAL MEETINGS.

SUPPOSITORY MOULDS, ETC.



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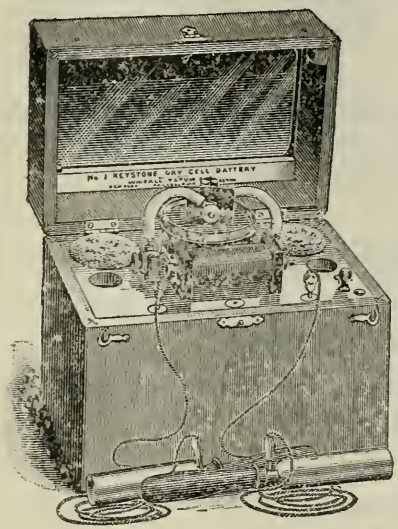

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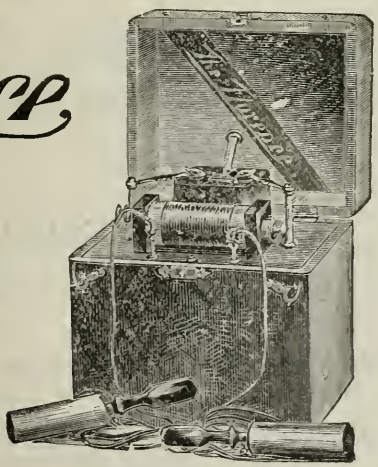

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PUBLISHED MONTHLY BY THE ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.

VOL. XXXVI. · · · JANUARY, 1900 · · · No. 1

Editorial.

PHILADELPHIA ASSOCIATION OF RETAIL DRUGGISTS.

The management of the Philadelphia Association of Retail Druggists is deserving of the warmest praise for the energy they have shown in securing members, the latter numbering over 50 per cent. of local pharmacists. The organization is now one of the strongest in the country. But extent of membership is not the most important consideration—this is the development of the personal interest of every member in the work of the association, and one of the best methods for bringing this about most easily is to have the members meet together, drop shop-talk for the nonce, and have a royal good time socially.

In line with this idea, the Entertainment Committee appointed by the Philadelphia Association of Retail Druggists to arrange the plans and details for a mammoth progressive euchre party to be held under the auspices of the association, met on Friday evening, December 15, 1899, at the residence of the chairman, D. M. Harris, 4109 Girard Avenue. The members present were: D. M. Harris, C. H. Campbell, Charles Leedom, J. G. Howard, Mahlon Kratz, Wm. L. Cliffe, E. T. Spencer, Thos. M. Newbold, H. C. Blair, Jr., H. L. Stiles, Jacob M. Baer, E. J. Finnerty. The permanent officers of the committee were elected as follows: Chairman, D. M. Harris; Vice-Chairman, Jacob M. Baer; Secretary, C. H. Campbell; Treasurer, H. C. Blair, Jr. The committee after discussion and deliberation decided to hold a progressive euchre on Wednesday evening, February 7, 1900, at Horticultural Hall, on Broad Street, near Spruce.

The following committees were named by the chairman:

Prize Committee—Charles Leedom, D. M. Harris, H. L. Stiles.

Ticket Committee—Thomas M. Newbold, Jacob M. Baer, H. C. Blair, Jr., Wm. L. Cliffe.

Hall Committee—J. G. Howard, E. T. Spencer, C. H. Campbell.

Publicity Committee—E. J. Finnerty, N. H. Laubach, C. H. Campbell.

It was decided to have patronesses, of whom the list is as follows:

Mrs. A. C. Ashmead, Mrs. J. M. Baer, Mrs. Blair, Mrs. H. A. Borell, Mrs. C. H. Campbell, Mrs. Theo. Campbell, Mrs. W. W. Chalfant, Mrs. C. H. Clark, Mrs. W. L. Cliffe, Mrs. G. P. Connor, Mrs. R. W. Cuthbert, Mrs. W. A. Eberly, Mrs. C. A. Eckels, Mrs. J. Eppstein, Mrs. G. W. Fehr, Mrs. W. A. Fetters, Mrs. E. J. Finnerty, Mrs. L. C. Funk, Mrs. W. H. Gano, Mrs E. R. Gatchell, Mrs. D. M. Harris, Miss S. G. Haydock, Mrs. A. Hoch, Mrs. C. E. Howard, Mrs. J. G. Howard, Mrs. C. E. Keller, Miss Laubach, Mrs. Chas. Leedom, Mrs C. L. Long, Mrs. J. D. McFerren, Mrs. Wm. McIntyre, Mrs. C. C. Meyer, Mrs. E. G. F. Miekley, Mrs. F. Morgan, Mrs. T. M. Newbold, Mrs. W. J. Pechin, Mrs. J. C. Perry, Mrs. E. M. Platt, Mrs. W. H. Poley, Mrs. D. G. Potts, Mrs. T. H. Potts, Mrs. W. Procter, Mrs. D. H. Ross, Mrs. W. A. Rumsey, Mrs. E. R. Smiley, Mrs. E. T. Spencer, Mrs. F. W. E. Stedem, Mrs. W. F. Steinmetz, Mrs. H. L. Stiles, Mrs. J. M. Stoever, Mrs. F. P. Streeper, Mrs. H. Swain, Mrs. G. Y. Wood, Mrs. H. A. S. Nolte, Mrs. W. B. Jones, Mrs. Geo. B. Winebrener, Mrs. Louis Murjahn, Mrs H. E. Nicoud, Mrs. David Preston, Mrs. J. Albert Rudy, Mrs. John D. Burg, Mrs. S. E. R. Hassenger, Mrs. Carl H. Bohn, Mrs. James P. Mallon, Mrs. N. F. Weisner, Mrs Wm. H. Laubach, Jr., Mrs. L. S. A. Stedem, Mrs. Wm. Morrison, Mrs. H. J. Seigfried, Mrs. W. H. F. Vandegrift, Mrs. H. J. Batdorff, Mrs. Farrow, Mrs. J. D. Seiberling, Mrs. C. F. Chandler, Mrs. J. P. Schmehl, Mrs. F. W. Jordan, Mrs. Julius Wolgemuth, Mrs. A. J. Frankeberger, Mrs. Geo. McC. Bowman, Mrs. Edward C. Stout, Mrs. A. T. Pollard.

A number of handsome prizes will be awarded, a list of which will be published later. The tickets for admission will be 50 cents, and the number sold is to be limited to 2,000. There will be 150 prizes, and the euchre is to be followed by a dance. Tickets may be had of any of the committeemen named above, or of the Chairman, D. M. Harris, 4109 Girard Avenue.

We urge local pharmacists, whether members of the organization or not, to give it their heartiest encouragement in the good work it is doing, and to come to the gathering to be held on February 7. You may not win all the prizes, but you will win, for the evening at least, if you come, a royal good time socially, and you will encourage the local organization to work all the harder for your interests as pharmacists.

Pharmaceutical Meeting.

The third stated Pharmaceutical Meeting of the Philadelphia College of Pharmacy for 1899–1900 was held Tuesday, December 19, in the College Museum, with James T. Shinn, Ph.M., in the chair.

Dr. A. R. L. Dohme, of Baltimore, was the first speaker on the programme. In introducing him to the audience the chairman alluded to the educational advantages Dr. Dohme had enjoyed and also to his special interest in the study of the alkaloids, both of which qualifications enabled him to speak with authority on the subject chosen.

Dr. Dohme then read a highly instructive paper on "The History of the Constitution of the Alkaloids."

Considerable discussion was elicited by the paper, and among those taking part in it were the chairman, Professors Moerk and Kraemer and Messrs. Kebler, Haussmann and Boring. Professor Moerk thought the address an excellent one and very opportune in one respect, as the students of the third year class, many of whom were present, are now being instructed in organic chemistry and just about taking up the subject of the alkaloids. He, furthermore, moved that a vote of thanks be tendered Dr. Dohme, and this motion was unanimously adopted.

Professor Kraemer was particularly glad that in the conclusion to his paper the author made a practical application of the knowledge involved in working out the theories concerning the alkaloids, for too often

knowledge of this character is not appreciated at its full value by those interested in practical and commercial questions.

Referring to the comparison which Dr. Dohme made of the formulas of hydrastine, narcotine and papaverine, Mr. Kebler said that it is well known that the introduction of a single OH group will change the nature of some organic compounds very materially.

Dr. Dohme replied that in some of the simpler compounds an OH group might cause a considerable difference, but when complex substances like the alkaloids are considered, and an endeavor is made to trace some connection or some relation between structure and organic effect, the difference caused by such a group becomes less marked.

In answer to a query by Mr. Haussmann as to the cause of the black color produced when pilocarpine and cocaine are mixed with calomel, Dr. Dohme said that pilocarpine is an ammonia derivative and hence affects calomel, and in case of cocaine he thought that perhaps the CHO group would cause it to have a reducing action on calomel.

Charles H. La Wall read an interesting paper entitled "The Herb and Drug Vendors on the Sidewalks of Philadelphia," which will be published in full in the February issue of the *American Journal of Pharmacy*. Mr. La Wall said that he had been collecting data on this subject for several years. Somewhat surprising was the statement made by him that 75 per cent. of the official drugs are growing within a radius of a few miles of Philadelphia, and also that more than 50 per cent. of the official drugs are sold on the streets of the city by persons who earn a livelihood by collecting them and preparing them for sale. The paper was accompanied by specimens and photographs of some of the vendors and their wares.

Professor Kraemer said that personally he was very much pleased that Mr. La Wall had taken up this subject. He said that he had known of persons going regularly to some one of these vendors for certain products on account of their excellent quality. In this connection he remarked upon the different channels into which the pharmacist's work is going and urged upon those present the necessity of obtaining a knowledge of just such subjects as were indicated in this paper. A vote of thanks was likewise tendered Mr. La Wall.

C. Carroll Meyer spoke of the cheapness and neatness of the packages of crude drugs put up by wholesale houses for retail purposes, but said that their quality was not likely to be known to the pharmacist.

E. M. Boring exhibited a sample of oil of orange, which, though quite old, was still in a state of preservation. This he said was due to the addition first of a small quantity of alcohol and then of water. Mr. Shinn said that he had also used a similar method—the difference being that he washed out the alcohol from the oil with the water, after which the oil kept very well.

On motion, the meeting adjourned.

Papers.

POWDERED EXTRACTS—THEIR MODE OF PREPARATION AND PRESERVATION.

By William E. Jenks.

Having for many years enjoyed exceptional opportunities in the laboratories of Messrs. John Wyeth & Brother, manufacturing pharmacists, of Philadelphia, to assist in the development of this particular line of work, the writer has been encouraged to offer

a brief contribution and endeavor to present in a comprehensive manner a few essential features necessary to ensure representative products of this class of the highest therapeutic value, believing at the outset that there evidently exists in the minds of many practical pharmacists but an imperfect conception of the detail involved in the preparation of these important products, occasioned, no doubt, by the limited literature published in pharmaceutical journals relating to this subject, as well as by the omission of official recognition as a class in the U. S. Pharmacopœia.

The impression formerly prevailed, and is undoubtedly entertained to this day by many actively engaged in the advancement of pharmacy, that nearly all these products present the same general uniform properties, devoid of individual and distinctive characteristics, and evidently appreciated only in proportion to their permanency as powders. If the average pharmacist should be asked for a descriptive definition, the information elicited would probably be "A light or dark brown powder, more or less hygroscopic, possessing in a moderate degree the physical properties of the drug and a heavy predominating, or what may be described as a charred, odor." An examination of the standard powdered extracts of to-day would be a revelation to many who entertain such delusive impressions. They will be found entirely divested of the slightest evidence of oxidation, possessing in a marked degree the well-defined physical and sensible characteristics of the respective drugs from which they are derived, such as odor, taste and color, and embodying and retaining in a concentrated condition and in their natural organic combinations all the original, proximate principles of the drug. This remarkable transition has been effected entirely through the introduction and perfection of an improved system of vacuum distillation, enabling a skilful operator to concentrate the various percolates to complete dryness, protected during every stage of the operation from the oxidizing influence of the air. The vacuum pan or still, which is designed for this purpose, is constructed in such a manner that a practically perfect vacuum, at a temperature not exceeding 120° F., is maintained until every trace of moisture has been eliminated and a perfectly dry, brittle mass remains. At this stage the extractive matter, as it is removed from the pan, presents a variety of interesting conditions in marked contrast to the charred masses resulting from open evaporation. The odor of the drug is strongly predominant, the fracture glistening and resinous in character, more or less transparent in thin layers, and in every case, so far as the writer's observations have extended, perfectly soluble in the original menstruum employed, indicating undoubtedly the unaltered condition of the proximate principles. After a careful determination of the actual weight of the dry extractive, sufficient diluent, in the nature of milk sugar or powdered drug, is added to bring the final product to a definite and unvarying relation to the drug, corresponding approximately to the pilular extract, and after thorough incorporation, reduced to a uniform powder. To insure an almost impalpable degree of fineness, as well as the utmost permanency for this class of preparations, it is imperative that every vestige of moisture should be dissipated, and the mass as it is discharged from the pan should be in condition to be speedily powdered.

If there should remain in the charge the slightest trace of moisture, it would occasion in time a tendency to what is commercially known as "cake," a soft, pasty condition, which it assumes preparatory to reverting to the original, solid state. It is an established fact and one universally recognized by pharmacists, that powdered extracts possess an inherent affinity for moisture ; the hygroscopic nature of many is such that they can only be employed with perfect freedom in exceedingly dry weather, and if, as is frequently the case, it should become necessary to manipulate the extracts in a moist, humid atmosphere, the operation

should be conducted with the utmost dispatch, and the exposure be as limited as possible. The absorption of moisture is frequently not observable at first, but shortly becomes manifest in the sinking of the powder, which eventually resolves itself into an intractable mass.

In connection with the above, the writer is pleased to submit to the Philadelphia College of Pharmacy a variety of these products, especially those possessing marked and distinct characteristics, thus enabling students and others interested in the development of this branch of pharmaceutical industry to make personal observations of the conspicuous features which have been outlined above.

In conclusion, the writer cannot sufficiently impress upon the dispensing pharmacist the importance of exercising the utmost discrimination in the selection of powdered extracts, for if they are not made by the vacuum process they must necessarily suffer much deterioration.

PLANT ENZYMES AS A POSSIBLE FACTOR IN DRUG ACTIONS.

By Joseph W. England.

In a paper in the December (1899) issue of the Alumni Report it was suggested by the writer that possibly the actions of alkaloid-containing vegetable drugs within the human economy might be influenced not only by the alkaloid, but also by the nutritive elements—plant-foods and plant-ferments or enzymes—contained in the extractives with the alkaloids. It has been thought desirable to prepare a paper giving the reasons for this belief, more especially with regard to the factor of plant-ferments or enzymes.

Like many other terms in scientific language, that of fermentation has broadened greatly in meaning in recent years. Formerly it indicated the fermentative process that led to the formation of alcohol; now it includes many forms of fermentative processes, yielding numberless products. Broadly speaking, it consists in the decomposition of complex organic molecules into simpler ones through the intervention of protoplasm or a protoplasmic secretion, working under certain conditions. A relationship has been shown to exist between protoplasm and metabolic processes—between ferments and the cell-changes of living organisms, high types of the latter as well as low ones.

Without question, one of the most interesting and instructive books upon the subject of ferments and fermentation that has appeared in the English language for years is the 480-page book of J. Reynolds Green, Professor of Botany to the Pharmaceutical Society of Great Britain, entitled "Soluble Ferments and Fermentation," printed by the University Press of Cambridge, London, and published in May, 1899. The American agent is the Macmillan Company, of New York.

It is not the writer's intention to present extended details regarding this work, but rather to review certain portions that seem to have a bearing upon the theory advanced that possibly plant-ferments or enzymes may be a factor in the actions of remedial substances within the human economy. The quoted statements are given with their page numbers, so that reference may be made to the original work.

Professor Green writes (pp. 7–8) that:

> Living *protoplasm* is probably reticulated in structure, its meshes being occupied by a material which is similar in composition, but which is not living. The great characteristic of protoplasm is its instability; it is constantly undergoing constructive and destructive changes. Some of the residues of its breaking-down are capable of being built up again into its substance;

others are thrown off from it. Of these, some are eliminated entirely from the organism, others are retained within it to carry on some of the more subordinate processes of life or its nutrition. An animal or vegetable cell is hence the centre of very vigorous activity; work is going on within it in the direction of incorporating material for the growth of the living substance, or of preparing material brought to it, so that it may be capable of such incorporation. Again, some of its substance may be undergoing decomposition with a view to supplying the energy which it needs for the maintenance of its vital processes. Various chemical changes, of course, result, such as protoplasmic, partially protoplasmic and non-protoplasmic changes, and quiescent as the cell appears, it is probable that processes of oxidation and reduction are taking place among the substances within the meshes of the protoplasmic network.

Concerning the *fermentative power of protoplasm*, he says (pp. 340, 341) that:

In cellular metabolism we have two different series of events, the one constructive, embracing the building up of simple substances into complex ones and culminating in the formation or repair of the living substance itself; the other destructive, marked by the decomposition of complex substances, with the ultimate formation of others of much greater simplicity. Many of these latter processes are carried on by enzymes, but this is not true in all cases, as there is a breaking-down of the protoplasm itself. The incorporation into the protoplasmic substance of the ultimately assimilated proteids, fats and carbohydrates goes on continuously, and no sooner is it constructed than it undergoes a species of self-decomposition, giving rise to many residues of various kinds, some of which are reincorporated with new material into its molecules, while others are broken down still further and eliminated. Not only does the protoplasmic substance itself undergo these changes, but different materials in the cells are also involved in them, and the residues are absorbed into and incorporated with the living substance in the same way as those which sprung from self decomposition. These changes are very largely of the same nature as the decompositions effected by enzymes, and they are spoken of as exhibiting the *fermentative* power of protoplasm.

Regarding *ferments*, Professor Green states (p. 7) that:

There are two classes of ferments: the one a living organism, working only during its own process of growth and multiplication; the other consisting of substances extractable by solvents from the cells in which they are formed, and capable of setting up decompositions apart from the life of such cells. The two categories were called *organized*, and *unorganized* or *soluble* ferments; now the term *enzymes* is generally used to indicate soluble ferments.

Further, he says (p. 13) that:

The *activity of enzymes* is very largely dependent upon temperature, being *nil* when approaching 0° C., and gradually increasing as the temperature rises, reaching maximum at a point that varies somewhat for each enzyme, but which ranges between 30° and 50° C.; beyond this point activity diminishes, and finally disappears. When 100° C. is approached, the ferments permanently lose their characteristic properties and are destroyed. This latter effect is apparently dependent upon their being in contact with water; for, if perfectly dry, they will survive heating to a much higher point. Enzymes show a peculiar sensitiveness to environment, being especially influenced by the reactions of the solutions in which they are working, some being active only in acid, others in neutral and others again in alkaline media. Slight alterations in composition of a favorable medium will frequently result in the stoppage of their action, or even in their destruction. Again their activity is, in all cases, lessened, and finally paralyzed by the presence of an excess of the products they form.

Chemically, ferments are proteid or nucleo-proteid in character (p. 394).

The diastatic enzymes are considered, as follows:

Diastase converts starch and its allies into soluble sugars. It is very probable that *diastase* is universally present in living vegetable cells: two varieties at least existing (pp. 16–17). It is obtained from the seed of barley (Hordeum distichon) which has been caused to enter the incipient state of fermentation, and dried. Leguminous plants are especially rich in it, the diastatic activity of the common pea (*Pisum sativum*) being nearly one-half that of malt (p. 21). It has been found in the potato, in gum arabic (p. 103), in the latex of *Ficus elastica*, *Carica Papaya* and *Papaver somniferum*, and also in certain fungi, such as the *Aspergillus niger*, and yeast cells, and it is excreted by bacteria (p. 24).

These statements recall those made by Jokichi Takamine, at a Pharmaceutical Meeting of the Philadelphia College of Pharmacy, held February 15, 1898 (ALUMNI REPORT, 1898, 49), who reported that he had found by experiment that all cereals possessed certain diastatic powers. He also obtained results that seemed to indicate that there are varieties of diastase which, while closely analogous, may be differentiated.

Animal diastase is widely distributed in the human body, being found in the salivary, pancreatic and intestinal juices, and possibly in blood and lymph (p. 33–34). It is identical with diastase of vegetable origin. Brown

and Heron have shown pancreatic and malt diastase to be absolutely the same (p. 44).

Inulase is an enzyme present in the fleshy roots of *Inula Helenium* (Inula) and decomposes inulin (p. 76). Professor Green has recently obtained it from the bulb of squill (*Scilla*) (p. 79). It has no action on starch and works best in a neutral or very faintly acid solution, excessive acidity or alkalinity destroying it (p. 83).

Cytase is a cellulose dissolving enzyme, which modifies the composition of cell-walls (p. 88). It is secreted by fungi and plays an important part in their development and their nutrition. It has been found in higher plants, but has not the wide distribution of diastase (pp. 92–93). It exists in germinating barley, and in certain varieties of the barley not germinating; also in rye and oats, the latter being especially rich in it (p. 96).

In the living organism, whether animal or vegetable, enzymes are found which are capable of effecting the hydrolysis of certain sugars with considerable facility, as follows:

Invertase is the enzyme that inverts cane sugar. It is found in fungi, in certain micro-organisms, in the petals of *Robinia viscosa*, *R. pseud-acacia*, *Papaver Rhœas*, some varieties of *Rosa* (p. 107), in the ripe fruit of the Banana (p. 113) and in the pollen of *Helleborus*, *Lilium*, *Narcissus*, *Richardia and Zamia* (p. 114). It has been found in the alimentary canal of mammals, being confined to the small intestine, its purpose being primarily to convert cane sugar into other sugars that can be assimilated by protoplasm (pp. 109–110). The power of the enzyme is practically inexhaustible; a sample which had induced inversion of 100,000 times its own weight of cane sugar was found by O'Sullivan and Tompson to be still active (p. 120).

Glucase (*Maltase*).—The enzyme that hydrolyzes maltose. Compared with invertase it is relatively weak, hydrolyzing only about 100 times its weight of maltose. It has been found in the blood, and the tissues and juices of the animal body. Kröber is of the opinion that it exists in normal malt; it is found conspicuously in various species of yeast (pp. 128, 129).

Trehalase.—The ferment that effects the hydrolysis of trehalose, the sugar found in Syrian manna, in ergotized rye; and also in certain fungi (pp. 130, 131).

Raffinase (Melibiase).—The enzyme decomposing the sugar known as *raffinose;* it is found in the root of the sugar beet, the seed of the cotton plant (*Gossypium*), in barley and wheat during germination, and in certain yeasts (p. 135).

Melizitase is a ferment capable of hydrolyzing a sugar (Melizitose) found in certain mannas (p. 136).

Lactase.—Mineral acids hydrolyze milk sugar yielding glucose and galactose. There exists in the animal body a soluble enzyme capable of carrying out similar work, called *lactase.* The mucous membrane of the jejunum of new-born children has been shown to be capable of hydrolyzing lactose (p. 138).

While it would be too much to say Green states (p. 141) that there is a special ferment for the decomposition of each glucoside, it is certain that a great number of such enzymes exist, as follows:

Emulsin is from the seeds of the bitter almond and hydrolyzes the glucoside amygdalin. (It is also present in the sweet almond, but not associated with amygdalin, as in the bitter almond.—J. W. E.) *Myrosin* is the characteristic enzyme of the Cruciferæ and several closely allied natural orders, being found in the seed of black mustard (*Sinapis nigra*) (p. 147), in the outer integument of the seed of *Carica Papaya*, and the extract of ground white mustard seed (p. 152), and in a very large number of plants belonging to different natural orders (p. 148). *Erythrozome* is found in the root of the madder plant (*Rubia tinctoria*) (p. 155). *Rhamnase* is present in the seeds of the Persian berry (*Rhamnus infectorius*) (p. 157). *Gaultherase* (Betulase) is an enzyme occurring in the bark of *Betula lenta*, in *Gaultheria procumbens* (leaves and berries), *Spiræa Ulmaria* (root), and several species of Polygala. It hydrolyzes *gaultherin* with the formation of methyl salicylic acid (oil of wintergreen) and glucose (p. 158). *Tannin*, according to Strecker, is a glucoside, and undergoes hydrolysis, yielding gallic acid and glucose. When certain gall infusions ferment, the tannin disappears, and gallic and ellagic acids and glucose replace it. The enzyme has not been isolated (pp. 160–161).

The proteolytic group of enzymes embrace those members that decompose various forms of insoluble proteids. Among these are *pepsin* and *trypsin*, that play such important parts in animal digestion.

As is well known, *pepsin* is generally obtained from the glandular layer of fresh stomachs of healthy pigs, by macerating it in 0·2 per cent. solution of hydrochloric acid, saturating the acid solution with a neutral salt, and collecting the precipitate, drying, etc.

Green writes (pp. 176–180) that:

During the maceration most of the membrane undergoes digestion. The precipitated pepsin obtained contains more or less of the proteoses of digestion. Non-acid maceration with glycerin dissolves the membrane to a very slight extent only. Dialysis will purify the product, but at considerable loss. Pekelharing has obtained a pepsin sufficiently pure for analysis, and has found it to give proteid reactions, and to contain less than 1 per cent. of phosphorus.

Pepsin exhibits a characteristic which makes it stand almost, if not entirely, alone among enzymes. It can

act only in the presence of a weak acid, the pepsin of the gastric juice of the vertebrata being always found combined with hydrochloric acid to the extent of 0·2 to 0·5 per cent. Other inorganic or even organic acids can replace the hydrochloric acid. Temperature is an important factor in peptic activity; the latter, increasing from feeble at 0° C., to maximum at from 50° C. to 60° C., when it weakens, and at 80° C. ceases, and the enzyme is destroyed. Dilution also affects activity. The best results are had when the digestive fluid contains from 0·5 to 0·01 per cent. of the enzyme. Various neutral salts markedly retard activity of the enzyme, especially ammonium sulphate, and sodium chloride (if present in greater amount than 0·5 per cent.). A great difference exists between the effects of neutral and alkaline salts, the former simply inhibiting peptic action until removed by dialysis or other means, and the latter destroying the enzyme entirely.

It is very doubtful whether a peptic ferment exists in the vegetable organism, most of the enzymes which have been investigated proving to be tryptic; the most notable case, which is still uncertain, is that of the secretion of *Drosera*, one of the insectivorous plants that Darwin claims contains an enzyme closely analogous to that of the mammalian gastric juice.

It is a curious fact, in view of the decomposing effect of alkaline salts upon the isolated peptic ferment, that sodium bicarbonate and pepsin are frequently prescribed together in cases of excessive gastric acidity and deficient peptic strength, with, it is alleged, excellent clinical results. May it not be, in these cases, that the alkali neutralizes the excess of acid in the stomach, forming sodium chloride, and that this (when present in not more than 0·5 per cent.) stimulates the outpouring of more gastric juice with more pepsin, thereby reducing excessive acidity and greatly increasing the amount of pepsin over that given with the alkali?

Trypsin is the characteristic enzyme of the pancreatic secretion of the higher animals, and the chief agent of the proteolysis which takes place in plants. While trypsin acts most vigorously in a faintly alkaline solution, it can act in a weakly neutral or weakly acid solution. In the pancreatic secretion, it is associated with several other ferments, among which are *pancreatic diastase*, a form of *rennet* and *lipase* (p. 183).

The chief enzymes of the proteolytic class of vegetable origin are *papain*, obtained from the juice of *Carica Papaya; bromelin*, from the fruit of pineapple (*Ananassa sativa*); the *trypsin* of germinating seeds and the enzyme of the secretion of *Nepenthes*, one of the so-called pitcher plants (p. 195).

Professor Green has noted the existence of a vegetable trypsin in the germinating seed of the castor oil plant (*Ricinus communis*), (p. 207). The juice of the fig tree (*Ficus Carica*) contains a powerful enzyme capable of di-solving proteid substances (p. 209). Various forms of bacteria also are known to form proteolytic enzymes (p. 216).

Lipase is the ferment that hydrolyzes fats. Professor Green states that:

Lipase is found in the intestinal tract, and also in the secretion of the pancreas. It has a wide distribution in the animal kingdom, and is also found in the vegetable kingdom, where it plays an important part in the utilization of the fatty reserve products stored in many seeds (p. 221). In its hydrolysis of fats it liberates glycerin and free fatty acids. Lipase was discovered in the germinating seed of castor oil plant (Ricinus communis) by Professor Green (in 1889) (p. 227).

The clotting enzymes embrace an interesting class, as follows:

Of these, *rennet* occurs in both the animal and vegetable kingdoms (p. 233); the chief source in the former being the mucous membrane of the stomach of young animals, particularly the calf (p. 235). Rennet has also been found in the juice of the papaw (*Carica Papaya*), in *bromelin* in the juice of the pineapple, in the bast of the stem bundles of *Clematis Vitalba*, and in many seeds, such as *Datura Stramonium*, *Pisum sativum*, *Lupinus hirsutus* and *Ricinus communis*. It acts in acid, neutral or alkaline solutions, and is most probably proteolytic in action (pp. 244–247).

Thrombase (the Fibrin-Ferment) is the animal enzyme that causes the coagulation of shed-blood; it more closely approaches rennet than any other enzyme so far discovered (p. 250).

Pectase is the plant-enzyme that with *pectin* causes the formation of the vegetable jellies of many ripe fruits. (Pectose is found in cell-walls and cell-sap and is readily converted into an allied body, pectin, by the action of an acid), (p. 268). Free acids interfere with the activity of pectase, a neutral medium being almost essential for the production of jelly. More than 0·1 per cent. of an acid in the juice of fruits will inhibit the ferment's action and may prevent gelatinization (p. 274). By the action of *pectase*, pectose or pectin can be converted into two gelatinous bodies, pectosic and pectic acids. Pectase is widely distributed in living plants; its function being connected with the changes that the cell-membrane undergoes during the life of the cell (p. 278).

Urease is an aerobic organism that decomposes the urea of urine into ammonium carbonate. It thrives in a strongly alkaline solution. Van Tieghem has observed a fermentation to continue until the liquid contained 13 per cent. of ammonium carbonate, a strength fatal to almost all other forms of vegetable life (p. 283).

The oxidases, or oxidizing enzymes, which assist in the oxidation of various sub-

stances, are somewhat widely distributed in both the animal and vegetable kingdoms, and directly oxidize various aromatic compounds and sugar. They are as follows:

Laccase is the oxidase concerned in the production of lacquer varnish from the crude sap of the lac tree of Southeast Asia. Laccase has been found in the roots of the beet, carrot and turnip, in the tubers of the potato, in the fruits of the apple, pear, quince and chestnut; in the vegetative parts of clover, rye grass and asparagus, and in germinating seeds, especially of plants of the Leguminosæ. The activity of laccase appears to be associated in some way with the presence and amount of manganese it contains, no other metal being capable of replacing it (pp. 294–295). *Laccase* exists in a considerable number of fungi (p. 296); a similar ferment has been found in the gills, labial palps and blood of certain molluscs (p. 298).

Tyrosinase, another oxidase, is found in the fungus *Russula nigricans*, Bull.; also in many genera of fungi, and in dahlia and the beet root. Bourquelot has found *tyrosinase* to act on all the cresols, resorcinol, guaiacol, thymol, carvacrol, *a* and *b* naphthol and ortho meta, and para-xylenol. He noticed, also, that it was effective when dissolved in a mixture of water and either ethyl or methyl alcohol, provided that not more than 50 per cent. of the spirit is present. The alcohols themselves are not affected by it (pp. 300–301).

The various flavours and odours which form the "bouquet" of different wines have generally been associated with the peculiarities of the fermentations induced by the different yeasts employed. Tolemi has recently brought forward reasons for thinking that some of them may be due to definite oxidases extractable from the yeasts (p. 306).

Beer yeast is claimed to contain an oxidase, likewise; the leaves of *Isatis alpina* and other indigo-yielding plants; ripe olives (which appear to oxidize the oil to oleic, acetic and sebacic acids) and the expressed juice of aconite and belladonna. The color of brown bread is said to be due to an oxidase in the bran (p. 307).

The oxidative power of human blood and various tissues strongly suggests the presence of an oxidase (p. 308).

Spitzer has ascertained that different tissues owed their oxidizing powers to the nucleo-proteid substances which they contained, and that the oxidative energy was proportional to the amount present. This work has been confirmed by researches that show the action to be due to a soluble enzyme, which is destroyed by boiling and by prolonged contact with alcohol. Oxidases have been found also in the tissues of certain animals (p. 311).

Alcoholic fermentation is due to an enzyme which Buchner has named *zymase*. It has been obtained from yeast, peas and barley (pp. 337–339).

In connection with the subject of oxidases, it is interesting to report some very recent work, as follows:

Woods (*Centr. f. Bak.*, 2 Abt., v., p. 745, *vide Pharmaceutical Journal*, of London, December 30 1899, p. 621) draws attention to the fact that chlorophyll by oxidation becomes decolorized and converted into a yellowish pigment, and suggests that oxidizing enzymes, which are widely distributed in plants, might take part in the autumnal destruction of chlorophyll and in the variegation and spotting of leaves. His experiments lead to the conclusion that two groups of oxidizing enzymes—oxidases and peroxidases—are normally present in small quantities in the higher plants. Under certain conditions, not well understood, these enzymes either become more active or are produced in larger quantities, causing variegations and various "diseases;" for example, the "mosaic disease" of tobacco. If the epidermis of a leaf showing yellow spots be carefully removed, and the cells moistened with a 2 per cent. alcoholic solution of guaiac resin, freshly prepared, the yellowish cells become intensely blue, while the surrounding healthy cells are much less deeply colored. Portions of leaves may be ground up with sand and extracted with distilled water and guaiac resin solution in absolute alcohol added. (Oxidizing agents, such as chlorine and nitrous acid, must, of course, be absent from the solution to be tested.) Those enzymes which give a direct reaction with guaiac resin are termed oxidases. Those which require the addition of peroxide of hydrogen are termed peroxidases. *These enzymes retain their activity for a long time in the dry state* (italics, J. W. E.). In aqueous solution the oxidases are destroyed by a five minutes' exposure to a temperature of 65°–70° C., the peroxidases by the same length of exposure to 80°–85° C.

An interesting query here arises: "Do animals create their own ferments, or do they obtain them directly and indirectly from the vegetable kingdom?" The vegetable kingdom supplies the necessary food for all animal life, and its failure so to do for a single year would, it is said, nearly depopulate the earth. As Gray states, in his "Structural and Systematic Botany" (pp. 201–202):

Animals *consume* what vegetables produce. They themselves produce nothing from the mineral world. The herbivorous animals take from vegetables the organized matter which they have produced; a part of it they consume, and in respiration restore the materials to the atmosphere, from which plants derived them, in the very form in which they were taken, namely, as carbonic acid and water. The portion they accumulate in their tissues constitutes the food of carnivorous animals, who consume and return to the air the greater part during life, and the remainder on decay after death. * * * * Moreover, plants not only furnish

all the materials of animal fabric, *but furnish each principal constituent ready formed* (italics, J. W. E.), so that the animal has only to appropriate it. The ternary vegetable products furnish the food of animals that serves to support respiration and maintain animal heat, in the form of sugar, vegetable jelly, starch, oil, etc., and even cellulose—substances which, containing no nitrogen, cannot form an integral part of the animal frame, but, conveyed into the blood, are decomposed in respiration; the carbon and excess of hydrogen combining with the oxygen of the air, to which they are restored in the form of carbonic acid and water. Any portion not required by the immediate demands of respiration is stored in the tissues in the form of fat (which the animal may either accumulate directly from the oily and waxy matters in its vegetable food, or produce by an alteration of the starch and sugar), as a provision for future use; a deficiency of such materials subjects the tissues themselves, or the proper supporting food, to immediate decomposition in respiration. The quaternary or azotized (that is, nitrogenous (E.)) products furnish the proper materials of the animal frame, the fibrine, caseine, albumen, etc., being directly appropriated from the vegetable food to form the blood, muscles, etc., while a slight transformation of them gives origin to gelatine, of which the sinews, cartilages and the organic part of bones consist, the earthy portion of the bones, the iron in the blood and the saline ingredients of the animal body are drawn from the earthy constituents of plants upon which the animal feeds. *The animal merely appropriates and accumulates these already organizable materials* (italics, J. W. E.), changing them it may be, little by little, as he destroys them, but rendering them all back—those of the first class through the lungs, of the second through the kidneys (etc.)—finally, to the earth and air, from which, and in the condition in which, the vegetable took them.

Now, since the animal kingdom is entirely dependent for food upon the vegetable kingdom, the latter furnishing the former with the materials of animal fabric ready formed, so that the animal merely appropriates and accumulates already organizable materials, may not the vegetable kingdom go further in its service, and furnish the animal directly and indirectly with its essential enzymes?

The objection that naturally arises to this thought is that, in cooked foods at least, the heat used in the cooking destroys the enzymes. But does it? The conditions may be entirely different in heating foods than in heating isolated enzymes. We know, for example, that when raw meats are placed in *boiling* water, and boiled, their soluble albumenoids are coagulated (and the enzymes present may be protected against injurious heat-effects), and the cooked meats obtained are juicy, tasty and nutritious. On the other hand, when raw meats are placed in *cold* water and heat is applied until the boiling-point is reached, the soluble albumenoids are dissolved out (and the enzymes may be destroyed), and the cooked meats obtained are dry, tasteless and less nutritious.

As a rule, in drying vegetable drugs or in making medicinal preparations of the same, the lower the degree of heat used, the better the product clinically. The amount of plant-enzymes brought into solution during plant-extraction is probably governed by the amount present in the plant and the percentage of water present in the menstruum used for extraction. A large amount of enzyme, however, may not be essential in a pharmaceutical preparation; a small amount may do an enormous amount of work, relatively, as shown with *invertase*.

The next objection that may be raised is that the alcohol used in making pharmaceutical preparations of many vegetable drugs may decompose the plant-enzymes. Probably there are few, if any, enzymes present in the strongly alcoholic solutions of the proximate principles of vegetable drugs, but they may be present in the hydro-alcoholic solutions. Professor Green states:

Enzymes are not destroyed by alcohol (*i. e.*, undiluted alcohol, J. W. E.) with the facility with which they are decomposed by heat; some are destroyed in a few hours, others resist decomposition for months, but all are decomposed in time (p. 405). Pavy has found liver diastase active *after being boiled in absolute alcohol* (p. 438).

If plant-enzymes are present in medicinal plants, or preparations of the same, they may be a possible factor in drug actions in the human economy in two ways: (1) directly, by remaining undecomposed in the drug or preparation and aiding in the assimilation of its proximate principles; or (2) indirectly, by decomposing the glucosides and other proximate principles present

in the freshly gathered drug during the process of drying, etc. The latter process may not be simple dehydration, but dehydration with cellular decompositions, varying with the amount of enzymes present and other factors.

In drug-drying the enzyme may become exhausted before a glucoside, for example, is entirely decomposed, or a small amount of enzyme only may be present; in either case variable quantities of decomposition products would result, and this may explain, in part, the variability in the percentage of proximate principles of some vegetable drugs.

Dohme and Engelhardt (Proc. Am. Ph. Assoc., 1897, 193) have obtained from the bark of *Rhamnus Purshiana* (cascara sagrada) a crystallizable glucoside, *purshianin*, which, when decomposed, yields emodin and a dextro-rotary, non-fermentable sugar, while the *frangulin* from the bark of *Rhamnus Frangula* (buckthorn) yields emodin and rhamnose as the sugar. As fresh cascara sagrada bark contains a ferment that causes griping upon medicinal administration, which the bark seasoned for two years does not contain, may it not be that the ferment exhausts itself during this time in converting some of the purshianin into emodin and sugar, similar to the manner in which other glucoside-splitting enzymes act?

Fresh frangula bark is a powerful gastro-intestinal irritant, capable of causing violent catharsis. Dried and seasoned, it is much less irritating and simulates rhubarb root in action. The British Pharmacopœia of 1885 directed that it should be at least one year old before being used.

A somewhat similar change may take place during the drying of rhubarb root, which, when gathered, contains about 80 per cent. of water, and when dried, contains emodin and sugar. The fresh root is seasoned for a year before being exported. May it not be that the emodin and sugar in the dried root have been formed from a pre-existing glucoside?

A study of the constituents of senna leaves yields some interesting facts. The active principle is the acid glucoside *cathartic acid*, and there is also present a non-fermentable sugar called *catharto-mannite*, or *sennit* (*U.S.D.*, 1899, 1220). The glucoside is obtained in a manner similar to the preparation of certain enzymes, *i. e.*, by evaporation of an infusion of senna *in vacuo*, and precipitation with absolute alcohol, redissolving in water and reprecipitating, purifying finally by means of dialysis. Alkalies with heat decompose it. Further (*Journal de Pharmacie*, January, 1874, 80), prolonged heating of the aqueous infusion of senna destroys its cathartic powers, the presence of an alkali hastening decomposition. Mineral acids have the same effect, but less energetically than alkalies, and vegetable acids decompose but feebly. Concentrated alcohol does not dissolve the active principle, which is soluble in cold water.

The fact that the active principle of senna leaves is obtained in a manner similar to that of certain enzymes, that it is soluble in water and insoluble in alcohol, that prolonged heating of the aqueous solution destroys it, that it is readily affected by free alkalies and free acids, and that it is active only in a neutral or faintly acid solution (acid from an organic acid), strongly support the belief that the activity of the leaves may be due to an enzyme. The cathartic acid and the sugar present in the leaves may have arisen from a pre-existing glucoside by the action of an enzyme.

There is no doubt as to the influence of fermentation in the curing of the green pod of the vanilla plant (*Vanilla planifolia*). When gathered, the pod is wholly destitute of aromatic properties, and contains about 80 per cent. of water. It requires three or four months to "cure," during which time it is exposed to air during the day, and put into caldrons, covered with blankets, and "sweated" at night. According to Bucholz (*U.S.D.*, 1899, 1443), the aroma is due to chemical changes that take place during and after the curing of the fruit. The odorous

principle is *vanillin*, and can be made synthetically by treating the glucoside *coniferin* (from Coniferous plants) with the ferment emulsin, whereby it is split into sugar and coniferyl alcohol, which, on being oxidized with a mixture of potassium dichromate and sulphuric acid, like coniferin itself, yields vanillin (*N.D.*, 1894, 1684). While it cannot be said that the green vanilla pod contains a coniferin-like body, the above facts indicate that its vanillin may be developed from some such compound by a ferment.

Fresh squill bulb contains about 82 per cent. of water. Among the solid constituents there are: *Scillin*, *scillitoxin*, *scillipicrin*, and a peculiar dextrin-like mucilage, *sinistrin*, which latter Kurtz (*A. J. P.*, 1894, 246) claims is decomposable by diastase, yielding a reducing sugar. Kurtz has also obtained a reducing sugar by direct exhaustion of the bulb with hot alcohol. Query: Does the presence of this sugar arise from glucosidal decomposition, or a sinistrin decomposition by ferments during the drying of the bulb; or may squill preparations, medicinally administered, be decomposed before absorption in the intestinal tract by the diastase normally there present?

When macerated in water the official "Prunus Virginiana" or wild cherry bark, as well as other species of *Prunus*, and of *Amygdalus*, yields a volatile oil consisting of benzoic aldehyde and hydrocyanic acid (*A. J. P.*, 1837, 300). These latter do not exist in the bark as such, but result from an action between a glucoside and a ferment (*A. J. P.*, 1839, 197). The bitter principle appears to be the fluorescent substance of wild cherry bark; it crystallizes and is glucosidal in character (*Western Druggist*, 1887, 331).

As Prof. Henry Trimble has pointed out (*A. J. P.*, 1898, 412), methyl salicylate has been found in a large number of plants including certain species of *Gaultheria*, *Betula*, *Polygala*, *Monotropa*, *Laurus*, *Spiræa*, *Benzoin*, *Erythroxylon*, and many others. If the volatile oil obtained by macerating the leaves of *Gaultheria procumbens* (wintergreen) in water and distilling, which is practically methyl salicylate, is the result of a reaction between the glucoside *gaultherin* and a ferment, as observed by Prof. Wm. Procter (*A. J. P.*, 1843, 243), may not the methyl salicylate obtained from other plants be formed in the same way? The official Senega root contains (see *U. S. D.*, 1899, 1214) 2 to 5 per cent. of senegin or saponin, 7 per cent. of sugar, and a laevo-rotary glucoside quite distinct from saponin; it yields over 0·25 per cent. of methyl salicylate, which may be formed from a glucoside and an enzyme.

The active principle, therapeutically, of castor oil is believed to be *ricinoleic acid*, which exists in the oil as glyceryl ricinoleate, and is decomposable by fermentation into the free acid and glycerin. The acid, as well as the glyceride, are active purgatives (*Archiv f. Exper. Path.*, XXVIII, 1890). A highly poisonous unformed ferment (*i. e.*, *unorganized* or *soluble ferment?* J. W. E.), *ricin*, exists in castor seeds, which, given hypodermically or by the mouth, excites violent inflammation of the gastro-intestinal tract, and produces changes in the protoplasm of the centric nerve-cells (*Medical Record*, XLIX, 1896). Henry Bower has obtained from the seeds an emulsin-like ferment which reacts with amygdalin and water, producing the odor of oil of bitter almonds in a small degree at first, but fully in a few days (*A. J. P.*, 1854, 208). Perhaps a small amount of an emzyme may be present in the fixed oil, or the oil may be partially decomposed in the intestinal tract by the enzyme *lipase* into free acid and glycerin.

The therapeutically active principle of the official croton oil is believed to be crotonoleic acid, which exists in the oil as glyceryl crotonoleate, and this is decomposable by fermentation into free acid and glycerin. The acid is a violent poison, much more irritating than croton oil. A ferment, *crotin*, exists in croton seeds, which is so poisonous that the subcutaneous lethal dose for a rabbit is from 0·05 to 0·08 gramme per kilo. Crotin attacks the blood corpuscles as well as the centric nervous system, and probably

affects all protoplasm. ("*On Some Toxic Albumins*," Upsala, 1887.) Crotin may be present in small amount in the fixed oil, or, more probably, the oil may be slowly decomposed in the intestinal tract by the ferment *lipase*, into free acid and glycerin; the slowness of decomposition and the presence of glycerin explaining, as Wood suggests (*U. S. D.*, 1899, 979), the clinical superiority of croton oil over crotonoleic acid.

The true nature of the active principle of the official ergot is an unsolved problem. Dragendorff's process for obtaining two of the most active constituents of ergot, *sclerotic* or *sclerotinic acid* and *scleromucin*, is enzymic in principle (see *U. S. D.*, 1899, 515). Voswinkel has obtained from ergot a brown amorphous substance, which he proved by hydrolysis to yield *mannose*. This is a hemi-cellulose body, and the name *mannan* has been given to it. He states that Dragendorff's sclerotic acid and scleromucin are identical with mannan (*Pharm. Centralhalle*, 1891, 531). Since the chemical principles so far isolated have failed to yield all the clinical effects of the drug, may not the activity of the latter be due to an enzyme as powerful in its way as croton or ricin? The wide distribution of soluble ferments among fungi lends plausibility to this view, as well as the fact that the sugar trehalose, formed by the ferment trehalase, is present in ergotized rye.

The writer has observed for a number of years that in those conditions where the use of tincture of ferric chloride was indicated, and there existed gastric irritability, the tincture was absorbed with the least gastric disturbance to the patient when given with pepsin solutions. Whether the astringent effect of the ferric salt upon the gastric mucosa results in checking pepsin-formation—and the associated pepsin supplies an essential amount—or whether peptones are formed by the enzyme and these aid in the iron absorption are questions to be answered. Peptonate of iron presents one of the least irritating forms of iron. Its contained iron is absorbed, not as peptonate —because that is non-dialyzable—but in some other form.

It is not necessary, at this time, to multiply instances showing the direct and indirect influence of enzymes upon the composition of vegetable drugs, nor to show the influence of pepsin, trypsin and other enzymes in the human body upon the absorption and cellular assimilation of proximate principles, nor to show whether animal enzymes are derivable directly and indirectly from the vegetable kingdom; but enough data has been presented to indicate that there is in the study of vegetable and animal enzymes, a field of work rich in possibilities to medical and pharmaceutical workers.

Our Graduates.

STORE CHANGES.

——Dr. Clement B. Lowe, '84, retired from the retail drug business several years ago, when he sold his store at Ninth and Vine Streets, this city. He has re-entered the profession of pharmacy again, however, this time in Pelham, Germantown, as he has assumed the proprietorship of the Pelham Pharmacy, having purchased it from Dr. B. J. Murray.

——Mentzer & Kottcamp have purchased the store at the corner of Chelton and Pulaski Avenues, Germantown, this city, established in 1887 by Smyser & English, and recently conducted by Michael Herr. H. H. Mentzer, the senior partner, received his early training and experience in the store of Frank E. Morgan, 1629 Walnut Street, and was graduated by the Philadelphia College of Pharmacy in 1893. For

over four years he was manager of one of the most prominent retail stores of Philadelphia. A. Francis Kottcamp received his degree from the Philadelphia College of Pharmacy in 1893. After graduation he entered the store of the late Rush P. Marshall, Sixteenth and Race Streets, where he was afforded every opportunity for advanced training and experience. He has held responsible positions in the city's prominent retail and manufacturing establishments.

CHANGE OF ADDRESSES.

——The following have changed their addresses. Their addresses now are :

——Henry Curtis, '99, Beverly, N. J.

——Milton Grotz, '95, Bethlehem, Pa.

——Henry K. Thompson, '98, Scio, O.

——Fred C. Heverly, '98, Ouray, Col.

——S. L. Cheek, '93, Tacony, Philadelphia.

——James P. Stratton, '93, Leadville, Col.

——John K. Garland, Centre, Perry Co., Pa.

——Otto Wm. Osterlund, '99, Overbrook, Pa.

——Chas. B. Allaire, '67, San Antonio, N. M.

——Wm. Lincoln Snyder, '88, Jacksonville, Fla.

——Charles A. Seler, '91, Hayfort, Trinity County, Cal.

——John C. Ziegler, '96, care Dale, Hart & Co., York, Pa.

——Jos. Wm. Ehman, '96, 220 Vine Street, Philadelphia.

——Harry A. Carman, 1315 West Lehigh Avenue, Philadelphia.

——Charles B. Evans, '88, 334 Ellison Street, Paterson, N. J.

——Josiah C. Peacock, '91, 2012 South Tenth Street, Philadelphia.

——Frank W. Heinbach, '96, 21 Ohio Avenue, Atlantic City, N. J.

——Ralph L. Haus, '98, southeast corner Twelfth and Vine Streets, Philadelphia.

——Melmoth M. Osborne, "Elkins Station," Ogontz, Montgomery County, Pa.

——Charles August Ritz, '98, corner Dauphin and Colorado Streets, Philadelphia.

——John A. McFoll, '99, southwest corner Smith and Morris Streets, Charleston, S. C.

——John Wm. Raker, '98, corner Frankford Avenue and Huntingdon Street, Philadelphia.

——Robt. S. Sherwin, '96, East Forty-second Street and Vanderbilt Avenue, New York, N. Y.

——Walter H. Umstead, '93, northeast corner Fifty-eighth Street and Woodland Avenue, Philadelphia.

PERSONALS.

——E. W. Spencer, '72, is editor and proprietor of the Albuquerque *News*, of New Mexico.

——Dr. Laurence E. Turnbull, '42, for thirty years Professor of Otology at the Jefferson Medical College, this city, has resigned his position.

——Dr. A. W. Miller was a delegate appointed by the National Wholesale Druggists' Association to the International Commercial Congress, held in this city.

——William L. Cliffe, '84, Treasurer of the Alumni Association of the Philadelphia College of Pharmacy, with his wife, has returned from his trip to Mexico, on pleasure bent.

NOTES.

——At the meeting of the International Commercial Congress, held at Philadelphia, in the National Export Exposition Building, the subject of trade-marks was discussed. Charles H. Duell, United States Commissioner of Patents, presided at the session when the question of commercial trade-marks was discussed, and read

a paper on "Commercial Value and Importance of Trade-Marks : Care Should be Used in their Selection." The manufacturers and merchants of this country, he said, must find an output for their products in the markets of the world, and that they are beginning to realize this is clearly shown by the statistics in reference to the export of manufactures. Nine months of the present calendar year show that such exports amounted to very nearly $280,000,000, against nearly $230,000,000 in the nine months of 1898. These exports form over 31 per cent. of our total exports, as against less than 27 per cent. for the corresponding months of 1898. Anything, therefore, which adds to our power to hold and increase this remarkable showing is of the utmost importance.

The speaker pointed out the importance of trade-marks in export trade, and gave some valuable advice as to the selection of a trade-mark. He was followed by Francis Forbes, United States Commissioner for the Revision of Trade-mark Statutes, who said it is the world's almost unanimous agreement that trade-marks should be protected by positive laws, but there is extreme diversity in the manner of such protection, and again in what constitutes a trade-mark. After reviewing trade-mark conditions in various countries, he said :

"It is not the governments which are neglecting to provide for trade-mark protection. The need of trade-marks lies rather in an awakening of users to their rights under existing laws."

Dr. F. E. Stewart, of New York, a graduate of the Class of '76 (P.C.P.), who spoke on "Some Anomalies in the Trade-mark System," said in conclusion : "I advocate the absolute divorce of the trade-mark from the secret patent system, which has been built up around it, and the limiting of the word mark to distinguishing between two or more brands of articles open to competition, and provided with names common to the language and free to the use of all. Then I would advocate an international agreement for a uniform trade-mark law recognizing and clearly enunciating this doctrine."

——The most practicable means of relieving the wants of the poor is to enable them to help themselves, by affording them work which shall yield fair remuneration or its equivalent. In this way the self-respect of the poor is retained, and the possibility of their becoming permanent charges upon the public is minimized. One of the best methods yet devised for this purpose is through the numerous "Vacant Lots Cultivation Associations," of which Philadelphia has one, and of which latter James T. Shinn, '54, Treasurer of the Philadelphia College of Pharmacy, is the President. The following abstract from a recent circular letter of the local association is of interest :

"Three years' experience in this city, where the most careful statistics have been kept, has proven the Vacant Lot Work a charity in the truest sense of the term. It lends a helping hand to those most in need, without pauperizing them. It points out to a needy brother where and how he can, by the 'sweat of his own brow,' relieve his pressing needs. It puts the weakest members of society on a self-supporting basis. It is an employment agency for those who are least able to work ; we find employment for the old, the lame, the deaf, the physically unable to do a full day's labor. It is a school in which those most in need of instruction are taught in the most practical way a new vocation, without any loss of time or expense to themselves and at a very slight cost to the community. Nearly 300 families are in attendance this season. It is a health resort for those most in need of improved health. The food thus secured is always fresh and wholesome ; the air is pure and invigorating ; the work develops strength and occupies the mind. It is an agricultural experiment station where various crops are tested and the different methods of cultivation and fertilizing are tried. The advantages of good cultivation are clearly

shown, by comparing gardens that are side by side. Every gardener sees with his own eyes that he who bestows the greatest care reaps the largest reward and receives the greatest praise. It lessens the necessity of fresh-air funds, country-week funds, etc., and makes the unpleasant work of investigation into worthiness of applicants a useless labor. It is an automatic separator. Any one who works his garden well and who can find no better employment is proven worthy, while he who does not cultivate his garden well thereby proves himself unworthy and loses the opportunity. Those who can find better employment always take it in preference to a garden.

"The 268 families who are this year cultivating nearly 300 quarter-acre gardens will enjoy a 'harvest home,' for which, if bought from the huckster, as he makes his daily rounds, they would pay at least $12,000 to $14,000, and take a much poorer quality, besides losing other benefits whose value cannot be estimated. The aggregate yield from all the farms this season amounts to from 3,000 to 4,000 bushels of potatoes; 10,000 to 12,000 baskets of tomatoes; 60,000 to 70,000 heads of cabbage; 10,000 to 12,000 dozen ears of corn; 10,000 to 12,000 stalks of celery; 4,000 to 5,000 bushels of turnips. In addition, there are egg-plants, carrots, parsley, cantaloupes, watermelons, cucumbers, cauliflower, beets, peppers, onions, radishes, etc., which make up a large part of the value of the crop."

Class News.

SECOND YEAR CLASS NOTES.

——Zeiger almost called 1900 a leap year.

——Music has been promised for Beta Phi meetings hereafter.

——Skillman succeeded wonderfully well even without "a chair."

——It has been found that the *Inquirer* article fits the lockers exactly.

——The list of those who spent the holidays out of the city is too long to print.

"Tickets, please."

"Here is a pass."

——Two lectures at the same hour on the 18th of last December. It was a case of "how happy could I be with either were the other dear charmer away."

——1900 has some good 200-pounders, but '01 found a place at the iron gate for them. The officer in blue insisted upon their remaining inside.

——The sympathy of '01 is with the 59 men who were unaccounted for last month. A careful census will prove their presence at the iron gate on October 23.

——Committee on Class Pins have secured a large number of samples and designs for the class pins. The class will be allowed to select the pin at the earliest possible meeting.

——"Facts and figures" of the November ALUMNI REPORT have 93 '00 men in the rush, but in the December number only 34. How many were there in October, the month of the rush?

——The Zeta Phi Society is being complimented on all sides on its reception of last month. It was one of the pleasant features of the College year, and enjoyed by every one who was fortunate to be present. The success was largely due to the management, and the care with which every detail was looked after.

——It is gratifying to note the interest 1901 is taking in the pharmaceutical meetings of the College. The attendance of the class at the last meeting was double that of

the previous one. Although some of the papers treat on subjects more advanced in the course, still, as Professor Remington says, "You can't help but learn something by attending the meetings."

EARL H. CONE,
E. F. W. GARBER,
Beta Phi Reporters.

THIRD YEAR CLASS NOTES.

THE RUSH OF OCTOBER 23, 1899.

AS SEEN BY P. CARLTON SUNDAY, CLASS POET OF 1900.

'Twas on a glorious Monday noon,
With a Lecture over all too soon,
When the Sr's. congregated en-masse
To keep from the room the 1901 Class.
To these this was a great surprise.
Ne'ertheless, their opinions began to arise
That they could rush to the lecture room
All together with one large boom!

To this the Sr's. did not agree
As from them rang "1900 P.C.P.!"
Then said the Jr's. "now for some fun"
As from their throats rang "1901!"
The Sr's. for leader had just the man,
Popular name—J. F. Sullivan—
Descendent of fighting-blood stock,
First cousin of John L.—so don't mock!

Assistant leader had just as much merit,
His name was Henry J. Garritt.
Third in command was a small fairy,
By name known as H. May Carey.
Then there was Jaeger, Franke and Eddy,
Magee, Hires, Holmes, Hampson, all ready,
McCaffrey, McClure and Big Willie McElwain,
All ready for the first five yards' gain.

Carl F. Moeller in the crowd stood back,
Of courage this German had no lack,
Around him stood Seip, Siegle and Witman,
Baker, Bishop, Dentler and Brennan,
But for strength one Sr. was far on top,
To the boys he's known as "Yonson Pop."
In stature "Pop" is exceedingly tall,
Six feet or so—perhaps that is all.

In a leader the Juniors had Michels, by name,
Since that rush he has lost all his fame;
Smooth with tongue did he aspire,
For 'twas read in Philadelphia *Inquirer*
That the Seniors changed to wall-paper flowers
Because Michels with his pen above all towers.
But in doorway alone there stood
Ziegler, of York, like a piece of wood.

Now to the rush next your attention,
For this is of a special mention;
The doors of the corridor opened wide
And there stood Juniors side by side.

"Now," said their leader, "come on for a rush,
We will grind the Seniors into jelly mush."
On they come, one hundred strong,
Singing as of sweet victory's song.

They rushed and rushed, but without avail,
The results always were the same old tale,
The Seniors formed an impregnable wall
That took more strength than Juniors to fall.
The wall-paper flowers began to form now.
Instead of Seniors they were Juniors somehow,
"Come," "try it again," cried their leader's voice,
"Each one, every one, all of the boys."

Another attempt now made the Junior band,
Some results following, on every hand.
The Grand Seniors were so closely massed
Comparison in strength was with ironcast.
The Seniors now with one accord sang
And with glorious Victory! Victory! rang;
Faintly the echo like the setting sun,
Scarcely could be heard the yell "1901."

Once more they attempt, but this the last;
In their minds the impression was cast
That 1900 was formidable and strong,
And can stand all the rushing as long
And often as Juniors may decide to choose.
'Twas impossible for Seniors to lose.
Professor Moerk in doorway appeared, to see
What became of Juniors' chemical class to be.

The spokesman of Juniors now began to cry:
"Professor Moerk, the bad boys won't let us by."
In answer, Professor replies, "don't fear,"
"Goody Juniors, you'll be Seniors—next year."
And then a wagon of police appear,
But none of the boys had any fear,
For a cop is a common article to college boys,
And are considered as so many tin-toys.

So the cops, to show that they were there,
Swooped in Mr. Eddy; to show the more,
One from that crowd was not enough,
So they took Roberts by another bluff.
And now things were even in classes,
One each from Seniors' and Juniors' masses.
Then all students went to station house door
Where there were coralled three students more.

Stolz, Hassinger and another by name,
Were the lucky boys to win their fame,
Who with their money wanted to bribe
Policemen, to discharge boys of their tribe.
Next time, ye boys of smoking bills,
Invest your coin in sugar pills,
For then you'll surely be on the top side
And in no danger of a City Hall ride.

Well do I remember five faces so sad,
All of whom were biting—lips—mad,
When they took their famous ride to City Hall,
Guarded by a score of cops so tall.
Then the learned judge the case he heard,
Took down the argument word for word;
"But," said the lawyer, "Your Honor, sir,
All these boys in the college were.

"The cops should have kept the street cleared,
And not a hand with the rush interfered,
And your Honor, sir, many a time
A grand rush had I with a son of thine."
"Then," said the judge, "the case is clear,
The boys before me need have no fear,
And since I see this is clearly so,
Tell the boys that they can go!"

A happier group of boys was never seen
Than these who locked up had nearly been;
But then the boys were not to blame
And this to all was shown, very plain.
Professor Remington put up the "dough,"
When the boys in peace were allowed to go.
So ended the rush, no one blundered,
But Victory! Victory! for 1900!

——'01 raised the cry "diamond pin lost," but '00 "called the bluff."

——The next time Seigel tries to make vanillin he will probably wear goggles.

——It is rumored that Kelly and Scott are booked for a week at one of our local theatres.

——Well, it has come at last. Magee actually admits that Conshohocken was defeated at basket ball.

——Colonel Bargillar Miles, Jr., is preparing for the trip to Millville, N. J. If you doubt the assertion just "size up" that new vest.

——Garritt is endeavoring to boycott the barbers. They say his new method of removing his curly locks is unique. He doesn't take gas, he burns it.

——Witman is destined to become a great chemist. While doing a little research work, recently, he discovered no less than four new elements. What won't he do when he gets down to steady work?

——It is not generally known that Hauber is an expert stock broker. Since learning the above we noticed that he breaks numberless evaporating dishes in the stock of the Pharmaceutical Laboratory.

——President Meredith, of the Zeta Phi, requests all talented members to hand in their names to the Chairman of the Social Committee. Now don't be modest, and hide your "light" under a tin funnel.

——Scott (the one from Delaware) is "all right" as a burnt-cork artist, and says if the Entertainment Committee desires it, he would make the attempt of his life to give them the "double shuffle" up to date.

——Professor Remington says the gentisic acid in gentian renders it incompatible with iron preparations. This trouble may be obviated by using a new gentian compound recently put upon the market. For further information inquire of C. Louis Seip.

——The Pennsylvania Class Society was organized recently, and the following officers were elected: President, C. Louis Seip, Philadelphia; Vice-President, C. E. Ricketts, Kane; Secretary, Miss Lulu A. Morgan, Scranton; Treasurer, Thomas C. Corson, Philadelphia.

——Our Foot-Ball Team, under the leadership of Captain Young, is the "real thing." It is daily improving (if such a thing is possible), and when the game with the U. of P. comes off, if we don't win, other women besides the historical Molly Stark will be widows.

——What a pity it is that the fraternity cannot secure phonographic records of the oratorical outbursts that occur upon the floor during our interesting class society discussions. These speeches form one of the many attractions of our Friday afternoon meetings, and are always eagerly awaited.

——The Historical Committee appointed by the President of the Zeta Phi to compile the annual record of the graduating class, or "The Graduate," is composed of the following members: Louis Franke, Chairman, Roy W. Dentler and Wm. C. Burchfield. Mr. Franke reports rapid progress and has already secured a considerable number of advertisements, which will materially aid in defraying the cost of publication.

——Since the last issue of the REPORT another addition has been made to our now long list of clubs. This new organization rejoices in the gorgeous title of the "Do

Little Club." A feature of the club is that the membership is limited, every member being an office-holder. The officers are as follows: President, Harry Wilkinson; Vice-President, Levi Scott; Treasurer, Wm. W. Buckman; Secretary, Wm. F. Kiefer; Assistant Secretary, H. A. Speck; Corresponding Secretary, J. Q. Mackey; Executive Committee, E. J. Kelly, Chairman, T. A. Duffy, F. G. Seward.

——Truly December was a great month for the formation of clubs; the last one on the list is known as "The Southern Club." The meeting at the time of the organization was presided over by H. L. Meredith, and the following officers were elected and installed: President, Levi Scott, Delaware; Vice-President, A. W. Beatty, Missouri; Treasurer, M. R. Irby, Virginia; Secretary, H. M. Carey, Delaware. A meeting will be held every Friday evening, at which different members of the club will conduct quizzes on pharmacy and allied branches, the aim of the club being to better equip its members for the final examinations, in which they are all more or less interested. The club makes its initial bow before the class small in numbers but large in purpose, and the representatives of the "Sunny South" are determined to make the club's influence felt in all matters pertaining to the welfare of the class and College.

——C. Louis Seip, President of the Pennsylvania Club, gave a smoker to the members of his class at the College, at his home, 2556 Frankford Avenue, on December 13, 1899. To say that all who were fortunate enough to be present enjoyed themselves would be putting it mildly; a large number were in attendance, and each and every one were given an opportunity to keep the crowd in a good humor. That the Class of 1900 contains a goodly number of men who are talented was evinced by the number of orators, singers, etc., who startled the natives by the uncanny noises that were wafted by the gentle zephyrs for which Kensington is famous. Among the men who deserve special mention are Messrs. Carey, Sunday, Garritt, Sullivan, Moeller, Seip, Hauber, and, last, but not least (except in stature), was Stinson's protege, "Bruno." The latter added very much to the enjoyment of all present, and was then and there declared the official mascot of the Class of 1900.

WALTER BROOKS,
ROBERT C. PURSEL,
Zeta Phi Reporters.

Items.

——A book that should be read, Geo. J. Seabury's book, "Shall Pharmacists Become Tradesmen?" has just come from the hands of the printers, and is now ready for delivery at 30 cents per copy, postage prepaid, and may be had by addressing Seabury & Johnson, New York. This is cost price of the book, which will be profitable reading to both proprietors and clerks.

——Report of meeting of Philadelphia Association of Retail Druggists, held January 5, 1900:

Meeting was called to order by First Vice-President W. H. Poley, at 3.15 P.M., and the attendance was larger than at any previous meeting. Four new names were added to our list of members. Among the correspondences received during the past month was a letter from the Burlington County Retail Druggists' Association, pledging the P.A.R.D. their loyal support, and, in order to keep in close touch with our work, proposed sending a delegate to attend our regular meetings.

J. C. Perry, Chairman Executive Committee, reported as follows:

Chairmen of Ward Committees had been appointed as follows:

Ward.

1 W. B. Jones.
2 Geo. B. Winebrener.
3 Louis Murjahn.
4 —— ——.
5 H. E. Nicoud.
6 D. G. Potts.
7 David Preston.
8 J. A. Rudy.
9 Chas. Leedom.
10 H. A. S. Nolte.
11 Wm. A. Fetters.
12 John D Burg.
13 Geo. W. Fehr.
14 E. R. Gatchell.
15 S. E. R. Hassenger.
16 Carl H. Bohn.
17 James P. Mallon.
18 A. Hoch.
19 N. F. Weisner.
20 L. S. A. Stedem.
21 Wm. Morrison.
22 W. H. Poley.
23 H. J. Seigfried.
24 H. L. Stiles.
25 W. H. F. Vandegrift.
26 W. W. Chalfant.
27 Thos. M. Newbold.
28 H. J. Batdorff.
29 Farrow Bros.
30 J. D. Seiberling.
31 D. H. Ross.
32 C. F. Chandler.
33 I. S. Schmehl.
34 Theo. Campbell.
35 F. W. Jordan.
36 Julius Wohlgemuth.
37 A. J. Frankeberger.
38 E. G. Brugler.
39 Harry Swain.
40 Edward C. Stout.

The above will take charge of all work in their respective wards, and make a monthly report to the Chairman of the Executive Committee. It was decided also that the Alumni Association be paid for mailing the ALUMNI REPORT for November and December to members of our Association who were not members of the Alumni Association, the amount being $3.81.

The following resolution was also offered:

That a Nominating Committee be appointed, composed of the President, Secretary, Chairman of the Executive Committee and the Chairman of the Ward Committees, or his substitute; that twelve constitute a quorum, and that they report at the December meeting nominations for the election of officers of the P.A.R.D.

On motion of H. Swain, which was adopted, the report of the Executive Committee was accepted, and the resolution ordered to be incorporated as an amendment to the By-Laws.

C. H. Campbell, Secretary of the Entertainment Committee, reported as follows: The following are the Committee: D. M. Harris, Chairman; C. H. Campbell, Jacob M. Baer, H. C. Blair, Jr., Thos. M. Newbold, W. L. Cliffe, E. J. Finnerty, Jr., Chas. Leedom, E. T. Spencer, H. L. Stiles, J. G. Howard, M. Kratz.

A progressive euchre has been arranged for, to be held in Horticultural Hall, February 7, 1900. About 150 prizes will be offered, and that tickets would be sent to all druggists, whether members of the Association or not. An orchestra has been engaged for the occasion, and those who do not care to play cards can dance or listen to the music. It is hoped that all druggists will take an interest in this affair, and help to make it a pronounced success.

A petition relating to the stamp tax on medicines has been given to each ward committeeman, who will see that it is signed by the druggists in their respective wards and forwarded to the Congressmen in the districts.

Bills amounting to $26.79 were presented and ordered paid.

Next meeting will be held Friday, February 2, 1900, at the Philadelphia College of Pharmacy, 145 North Tenth Street, 3 P.M.

W. A. RUMSEY,
Secretary.

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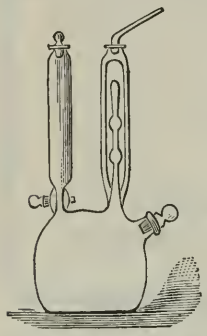

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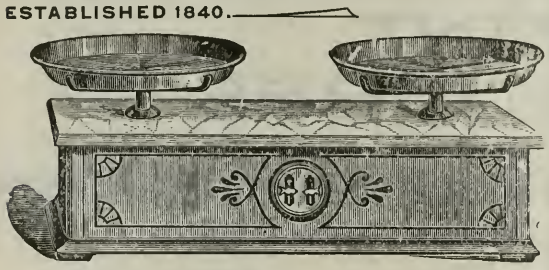

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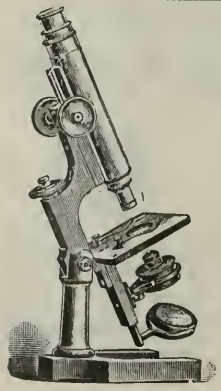

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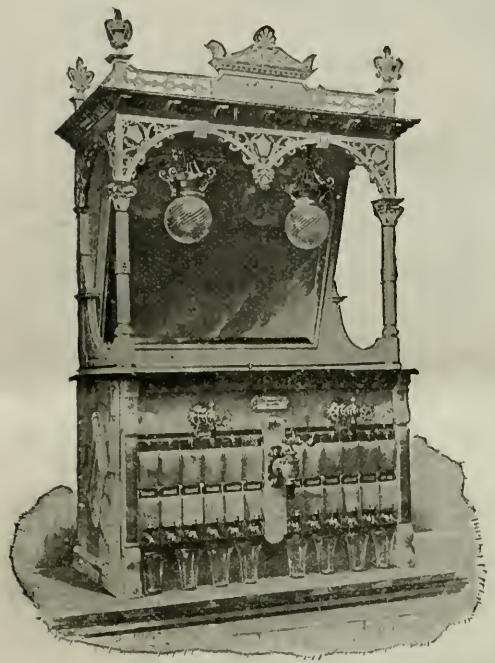

MATERIALS AND WORKMANSHIP
ATTRACTIVENESS OF DESIGNS
DURABILITY OF CONSTRUCTION
DELETERIOUS CONTAMINATION
REFRIGERATION OF SODA WATER
PROVISION FOR CONDENSATION
ECONOMY OF ICE COMPARTMENT
RAPIDITY OF SYRUP SYSTEM
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Fig. A.

This nurser has a novel feature in being made so the Nipple cannot pull off. There have been many accidents with the ordinary bottle, caused by the child pulling off the nipple and drenching itself with milk. And cases have been noted where the child has choked itself with the nipple.

Nothing of this kind can happen with the **BETSY BROWN NURSER.**

The Nipple is pulled on the plain extension of the bottle. The Screw Collar (made of Aluminum) is then brought over the Nipple and screwed down on the screw on the bottle, holding the Nipple securely in its place. Any pull over Nipple can be used. Bottle is 8 oz. capacity, graduated.

The Price Quoted does not include Nipples

Per Dozen . . . . . $0 75 Net
Per Full Gross . . . . . 8 00 "

PATENTED JULY 6th, 1897

Fig. B.

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It is easy to take, prompt in its action, sure to succeed in revitalizing the blood and re-invigorating the whole system. It succeeds so well because it represents the actual molecular conditions existing in the red corpuscles of the blood.

Put up in 16-oz. bottles ("Ribbon," "Shield" and "Blood" styles); also in 12-oz. bottles ("Mortar" style only); otherwise, in any special color or kind of label and wrapper.

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